Integrating 3-D Scanning into the AG Sharing Special Purpose Devices

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Integrating remote devices

- Analytical Electron Microscope
 - Web based interface
 - Collaborative
 - Custom built
- Other devices
 - Telescope
 - MRI machines
 - 3D scanners
 - Remote nodes?



What does it mean to have a remote device in a shared space?

- Controls?
 - How does control get exported, does everyone have control?
- Status?
 - What is the status of the device? How is that updated?
- Data?
 - What data is shared? How does this change?

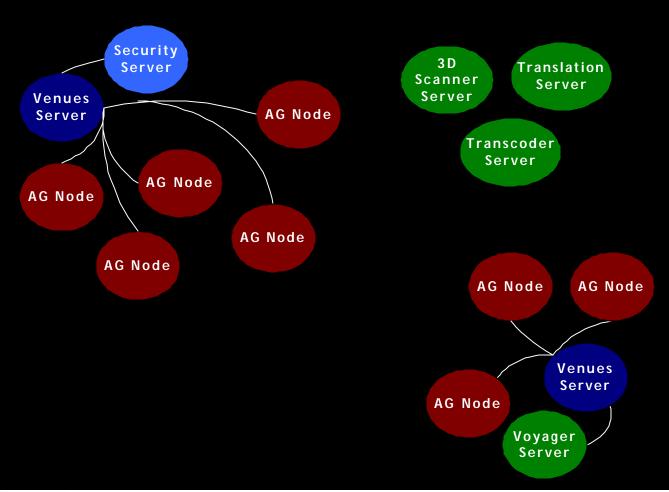


Interface to remote device

- Device specific
 - Does every device need a custom application?
- Generalized toolkit
 - Definition by abstract interface?
 - Self publishing interfaces?
 - Generic client front-end



Access Grid Entities



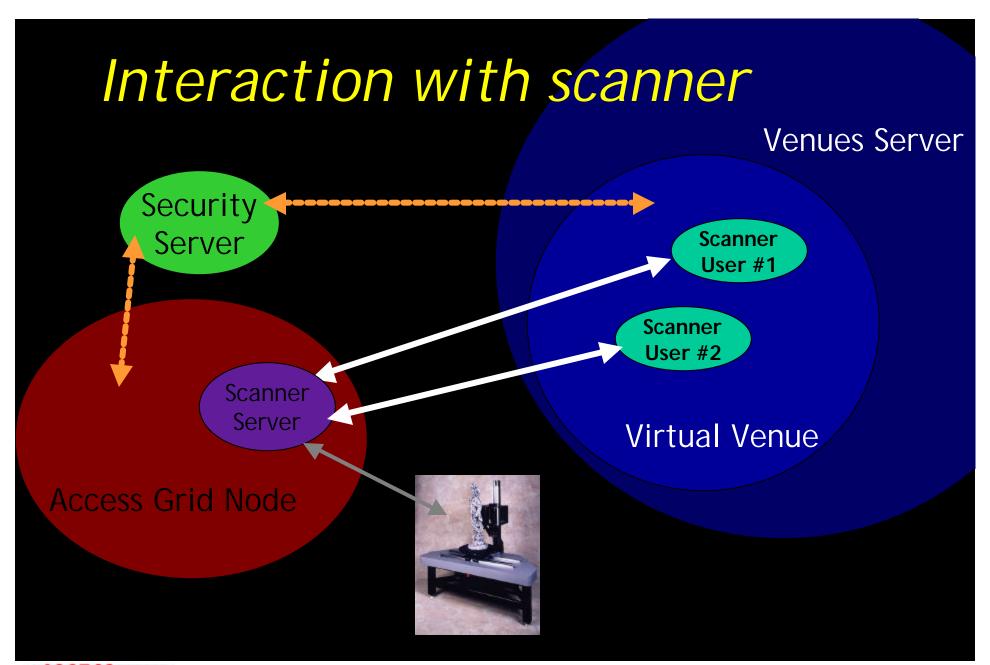


3-D scanner integration

- This is not how to display in 3D on AG
- Interface to remote scanner
 - Interact with scanner
 - Interact with output





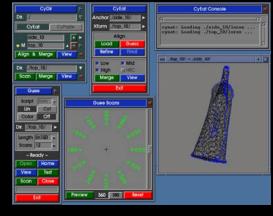




To acquire a scan

- Operating the scanner
 - Exporting of controls
 - Handling multiple users
 - Addressing problems of distance



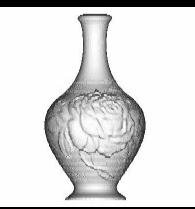


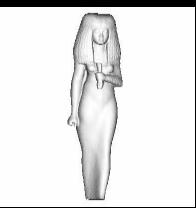
User Commands: Keyboard, Mouse, Menus, Buttons



Example of 3D Object

- Vase
 - 136192 Polygons
 - 17s scanning (1 scan)
 - ~8000 poly/s
 - ~1 Mbit/s
- Isis
 - *375284 Polygons*
 - 44m scanning (34 scans)
 - ~140 poly/s

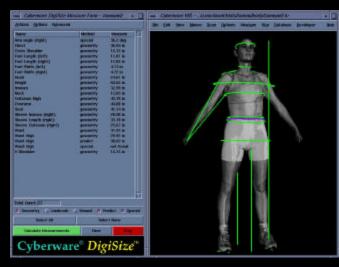






Output viewer

- Controls
 - Changing viewpoint
 - Rendering output
 - Changing view parameters
 - Hiding information
 - Performing measurements
 - Capturing images





Scanner to AG

- What does the scanner output?
 - Conversion of output (server) to client format
 - Conversion to AG supported format
- What about node capabilities?



Intelligent interaction with output

- Knowledge of application performance
 - Network services
 - Graphics capabilities
- Knowledge of underlying machine capabilities
 - Machine querying tools



- Node Information
- Combine Combine
- Network Connection
- Video Capture Cards
- Audio Capture Card
- Software Versions
 Resource Labeling Detail
- Presenter Camera i control:/dev/tty50
- Dynamic Configuration
- Ourrent Node Operator
- Current Venue
- Current Docked Users
- Current Audio Level
- Window Layout
- Multicast connectivity quality among nodes in the same Venue



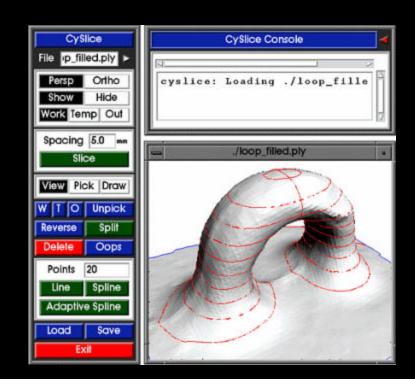






Output on the AG

- Interactive interface
 - Flexible interface
 - Collaborative
 - Annotation
- Recordable
 - Model
 - Interaction
 - Annotation





Interface

- Same client interface for all devices?
- How is sharing information presented?
 - In interface?
 - In data?
- Does everyone get the same controls?
- Does everyone get the same view?
- How are different presentation modalities handled?
 - Sitting at laptop versus presenting in front of group



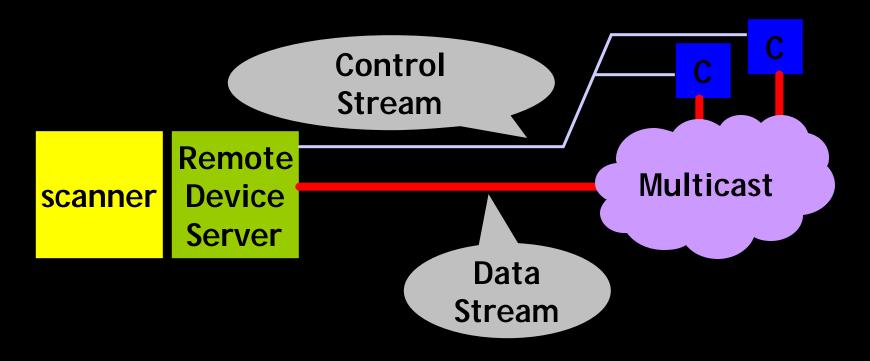
Annotation

- How do you annotate?
 - Pointing
 - Voice comments
 - Data manipulation





? Device Integration





References

- Scanner Information
 - www.cyberware.com
 - www.cyra.com

